REMARKS

The August 14, 2006, Official Action and the references cited therein have been carefully reviewed. In view of the amendments presented herewith, the Declaration under 37 C.F.R. §1.132 and the following remarks, favorable reconsideration and allowance of this application are respectfully requested.

At the outset, it is noted that a shortened statutory response period of three (3) months was set forth in the August 14, 2006 Official Action. Therefore, the initial due date for response is November 14, 2006. This response is being filed within the initial 3 month response period.

As another preliminary matter, the Examiner has deemed the restriction requirement set forth in the March 21, 2006 Official Action to be proper and made the restriction final. Applicants reserve the right to petition the propriety of the restriction requirement issued in the above identified patent application for the reasons made of record in Applicants' response thereto.

Claims 1-22 and 24-28 are pending in this application, and claims 17-21, 25, 26, and 28 are under consideration. Claims 18, 19, 25, 26, and 28 stand rejected under 35 U.S.C. §112, second paragraph for alleged indefiniteness.

The Examiner has rejected claims 17-21, 25, 26 and 28 under 35 U.S.C. §101 because the claimed invention is allegedly not supported by a specific, substantial, or a well-established utility. As a result, the Examiner also rejected claims 17-21, 25, 26 and 28 under 35 U.S.C. § 112, first paragraph contending that since the invention allegedly lacks utility, one skilled in the art would not know how to use the claimed invention.

Claims 17-21, 25, 26 and 28 have also been rejected

under 35 U.S.C. § 112, first paragraph for allegedly failing to satisfy the enablement requirement of the statute.

Lastly, claims 17-21, 25, 26 and 28 stand rejected for allegedly failing to satisfy the written description requirement of 35 U.S.C. §112, first paragraph.

The foregoing objections and rejections constitute all of the grounds set forth in the August 14, 2006, Official Action for refusing the present application. Applicants respectfully request reconsideration and examination of this application and the timely allowance of the pending claims 17-21, 25, 26 and 28 in view of the arguments set forth below.

CLAIMS 18, 19, 25, 26 and 28, AS AMENDED, SATISFY THE REQUIREMENTS OF 35 U.S.C. §112, SECOND PARAGRAPH

The relevant inquiry in determining whether a given claim satisfies the requirements of 35 U.S.C. §112, second paragraph, is whether the claim sets out and circumscribes a particular area with a reasonable degree of precision and particularity such that the metes and bounds of the claimed invention are reasonably clear. In re Moore, 169 U.S.P.Q. 236 (CCPA 1971). Applicants respectfully submit that with respect to amended claims 18, 19, 25, 26 and 28 of the present application, such inquiry must be answered in the affirmative.

The Examiner has rejected claims 18, 19, 25, 26 and 28 under 35 U.S.C. §112, second paragraph for alleged indefiniteness. Specifically, in claim 18, the Examiner contends that the terms "PGK" and "CMV" are abbreviations which can have various meanings and are vague. In

response, Applicants have amended claim 18 to include the terms "phosphoglycerate kinase" and "cytomegalovirus" thereby rendering this rejection moot.

The Examiner has further rejected claim 25 asserting that the recitation "a host cell isolated from the transgenic mouse of claim 17" lacks proper antecedent basis since claim 17 fails to recite any transgenic mouse. Claim 28 is rejected for a similar recitation of a "transgenic mouse" limitation which refers to claim 18. Applicants have amended claims 25 and 28 to recite that the host cell is isolated from the "transgenic animal" of claim 17 and claim 18, respectively. Support for the amendments specifying that the host cell is isolated from a transgenic animal can be found at page 38, line 29 over to page 39, line 7. Accordingly, Applicants submit that claims 18, 19, 25, 26 and 28 are definite on their face as the skilled artisan would be readily appraised of the metes and bounds of these claims as amended.

In light of the foregoing remarks and claim amendments, Applicant respectfully request that the above-mentioned rejections under 35 U.S.C. §112, second paragraph be withdrawn.

CLAIMS 17-21, 25, 26 AND 28, AS AMENDED, SATISFY THE REQUIREMENTS OF 35 U.S.C. §101 AND 35 USC § 112, FIRST PARAGRAPH

It is the Examiner's position that claims 17-21, 25, 26 and 28 fail to satisfy the utility requirement under 35 U.S.C. §101. Specifically, the Examiner asserts that the specification provides general assertions and has not provided any suggestion of a correlation between any

phenotype of the claimed transgenic animals, the altered ferritin light chain gene, and a disease or disorder. Additionally, the Examiner also contends that without a utility, one skilled in the art would not know how to use the invention under 35 U.S.C. § 112, first paragraph. Applicants respectfully disagree.

The MPEP states at §2107.02(III)(A) that "an applicant's assertion of utility creates a presumption of utility that will be sufficient to satisfy the utility requirement of 35 U.S.C. §101." Applicants respectfully submit that the Examiner has failed to overcome this presumption.

Amended claim 17 now describes the genotype and phenotype of the claimed transgenic animals of the invention. Support for the amendments can be found in the specification at page 79, lines 4-11 and Figure 4. Clearly, these FTL variant transgenic animals could be used to "develop screening methods to screen therapeutic agents to identify those capable of modulating FTL variant activity." (See specification page 43, lines 2-5). Such agents may have efficacy in the treatment of certain diseases and disorders, such as heredity ferritinopathy. Additionally, at page 38, the instant specification clearly teaches that "[t]ransgenic mice expressing the FTL variant of the invention provide a model system in which to examine the role of the FTL variant in the development and progression of a neurodegenerative disease." (page 38, lines 6-10). Furthermore, the transgenic animals "will facilitate the molecular elucidation of the role that a target protein plays in various cellular processes, including: the intracellular accumulation of ferritin and/or iron, biochemical pathways involved in iron

metabolism, and the development of degenerative disorders related to aberrant accumulation of intracellular iron, particularly those affecting the nervous system." (page 38, lines 18-25).

Clearly, the instantly claimed transgenic animals are supported by the above credible, specific and substantial utilities. Significantly, the MPEP at §2107.02(I) states that "an applicant need only make one credible assertion of a specific utility for the claimed invention to satisfy 35 U.S.C. §101." Indeed, once an invention has been determined to be "useful for some purpose, it becomes unnecessary to decide whether it is in fact useful for the other purposes 'indicated' in the specification as possibly useful." MPEP §2107.02(I). Lastly, Applicants respectfully submit that, contrary to the Examiner's position, a skilled artisan would find the utilities described above, in particular the use of the transgenic animals to screen therapeutic agents to identify those capable of modulating FTL variant activity, to be specific, substantial, and well-established utilities.

In light of the above described utilities, Applicants submit that nothing more is needed to satisfy the requirements of 35 U.S.C. §101. Applicants respectfully submit that the instant rejection of claims 18, 19, 25, 26, and 28, drawn to transgenic animals, is untenable and respectfully request its withdrawal.

Regarding the Examiners rejection of claims 17-21, 25, 26 and 28 under 35 U.S.C. §112, first paragraph, the instant specification clearly enables practice of the invention encompassed by the claims. As described in Example I, beginning on page 55, a hereditary neurodegenerative disorder termed hereditary ferritinopathy

is associated with a genetic defect in the coding region of the FTL gene (i.e., a TC insertion after nucleotide 498). Hereditary ferritinopathy is clinically characterized by tremors, cerebellar signs, extrapyramidal and pyramidal signs, behavioral disturbances and cognitive dysfunction. The specification teaches that the most striking pathologic alteration is the presence of intranuclear ferritin bodies in glial cells within most gray and white matter areas of the cerebrum, cerebellum and brain stem, shown in Figures 9-14, and 17 of the instant specification (see page 74, lines 21-24).

Applicants have developed a transgenic mouse that over-expresses a human-FTL cDNA that encodes the FTL variant gene (TC insertion following nucleotide 498). These FTL-transgenic mice recapitulate key features of the pathology observed in human hereditary ferritinopathy. In particular, the transgenic mice with the altered FTL gene have intranuclear and intracytoplasmic ferritin deposits. (See Declaration of Dr. Vidal, attached hereto). Additionally, these intranuclear and intracytoplasmic ferritin deposits were seen in neurons of the cerebellum and brain stem. The mice also showed behavioral and motor deficits such as inability to grip a wire cage, inability to spread hind limbs upon tail elevation and lack of grooming. Expression of this altered FTL gene (TC insertion following nucleotide 498) in transgenic mice correlates with the phenotype of intranuclear ferritin deposits in glial cells observed in human cases of hereditary ferritinopathy. These correlations establish a "real world" use of the claimed transgenic animal. Therefore, the claimed invention is supported by a specific utility, and thus, one skilled in the art would know how to

use the claimed invention (i.e., for screening therapeutic agents to identify those capable of modulating FTL variant activity.)

Applicants submit that the methods disclosed would apply to screening an agent capable of modulating FTL variant activity. Inasmuch as the phenotype of hereditary ferritinopathy is known in the art, Applicant contends that the instant specification has specific and substantial utility, and does not entail an invitation to experiment since Applicants have set forth a functional use for transgenic animals embraced by the claims. Therefore, Applicants request that the rejection of the claims on this basis be withdrawn.

CLAIMS 17-21, 25, 26 AND 28 SATISFY THE ENABLEMENT AND WRITTEN DESCRIPTION REQUIREMENTS OF 35 U.S.C. §112, FIRST PARAGRAPH

The Examiner has rejected claims 17-21, 25, 26 and 28 for failing to satisfy the enablement requirement of 35 U.S.C. §112, first paragraph. Specifically, the Examiner asserts that the claims contain subject matter which was not described in the specification in such a way as to enable a skilled artisan to make or use the invention. It is the Examiner's position that the specification fails to provide adequate guidance and evidence of how to make the claimed transgenic animals comprising an altered FTL gene, and further that the specification fails to disclose any phenotype. The Examiner concludes that a skilled artisan would have to engage in undue experimentation to practice the full scope of the invention claimed. Additionally, it is the Examiner's position that claims 17-20 and 26 fail to

satisfy the written description requirement under 35 U.S.C §112, first paragraph because the specification fails to disclose generation of any transgenic animal and also fails to disclose any phenotype of the claimed transgenic animal. The Examiner also rejected claims 17, 20 and 25 because the genus of FTL genes encompassed by the claims lack a written description and a skilled artisan would not recognize that the inventor has possession of the claimed invention. Applicants strenuously disagree with the Examiner's position for the reasons set forth below.

A. Enablement

The Examiner has applied the enablement factors provided at §2164.01(a) of the MPEP and concluded that, in view of the allegedly undeveloped and unpredictable state of the art and the alleged absence of guidance with regard to transgenic animals, a skilled artisan would have to perform undue experimentation to practice the full scope of the claimed invention.

Applicants respectfully disagree with the Examiner's position. In In re Wands, 8 USPQ2d 1400 (1988), the Federal Circuit Court of Appeals held that engaging in experimentation to practice a claimed invention does not render the disclosure non-enabling as long as the experimentation required is not "undue". The Court stated that: "The determination of what constitutes undue experimentation in a given case requires the application of a standard of reasonableness ... The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine or if the specification in question provides a reasonable

amount of guidance with respect to the direction in which the experimentation should proceed." In re Wands, 8 USPQ2d 1400, 1404 (1988).

Applicants contend that the instant specification discloses the preferred methods to generate transgenic animals. Exemplary methods of transgenic animal production are disclosed in the specification (see, e.g., page 38 lines 12-17 over to page 41, line 23) and Applicants contend that the a skilled artisan could effectively apply these methods to produce the transgenic animals. Any experimentation required for generating the claimed transgenic animals is standard in the art and cannot be considered undue.

The Examiner's attention is also respectfully drawn to In re Strahilevitz, 212 USPQ 561 (CCPA 1982) wherein the court held that a broad immunological method claim having "nearly universal applicability" was enabled even without working examples. Cases like Strahilevitz hold that an adequate description of purely conceptual inventive work can meet the requirements of 35 U.S.C. §112 and allows inventors to file patents before obtaining working examples. The MPEP also recognizes the acceptability of prophetic examples in §608.01(p)(II) stating that "[s]imulated or predicted test results and prophetic examples (paper examples) are permitted in patent applications ... Paper examples describe the manner and process of making an embodiment of the invention which has not actually been conducted." In re Borkowski, 164 USPQ 642 (CCPA 1970), is also enlightening on this point, there the court stated "[A] specification need not contain a working example if the invention is otherwise disclosed in such a manner that one skilled in the art will be able to

practice it without an undue amount of experimentation." The Examiner is respectfully reminded that an Applicant is entitled to claim the full scope of what was invented.

In further support of the enablement of the present invention, one of the inventors, Dr. Ruben Vidal has provided a declaration under 37 C.F.R. §1.132 attesting that the specification is fully enabled with regard to the subject matter encompassed by claim 17. The declaration attests to Dr. Vidal's development of a transgenic mouse that over-expresses a human-FTL cDNA carrying the FTL TC-insertion after nucleotide 498 under the control of the mouse prion protein gene promoter. Furthermore, Dr. Vidal has demonstrated that these mice have intranuclear ferritin deposits in neurons of the cerebral cortex, and cerebellum. Additionally, the transgenic mice showed behavioral and motor defects which recapitulate key features of the pathology observed in hereditary ferritinopathy. Dr. Vidal asserts that the materials and methods used to generate these mice were disclosed in the specification and are readily available to the skilled artisan. As detailed in Dr. Vidal's declaration, the specification provides enablement for generating transgenic animals having a variant FTL gene. In view of the successful introduction of the FTL-variant gene into mice, the expression of the gene in the cells of an animal, and the production of mice with the desired phenotype, it should be apparent that the invention is both fully enabled by the disclosure and has been reduced to practice. See Dr. Vidal's declaration and Exhibits B-D attached thereto.

The Examiner has also rejected claims 17, 20 and 25 since the specification allegedly fails to enable

expressing any FTL variant gene in a mouse by using a sequence other than that set forth by SEQ ID NO: 1.

Applicants respectfully disagree with the Examiner's position. However, in the interest of expediting prosecution of the instant application, Applicants have amended claim 17 to recite SEQ ID NO: 1, which no longer reads on variant sequences. Inasmuch as this sequence is disclosed in the application, Applicants submit that the specification is fully enabling for practicing the invention claimed. Furthermore, pending claims 20 and 25 are dependent on claim 17; therefore, they too are enabled.

It is respectfully submitted that the subject matter encompassed by the amended claims is fully enabled by the disclosure in the application. Thus, the rejection of the claims on this ground is inappropriate and should be withdrawn.

B. Written Description

It is the Examiner's position that claims 17-20 and 26 fail to satisfy the written description requirement under 35 U.S.C §112, first paragraph. Specifically, the Examiner asserts that the specification fails to disclose generation of any transgenic animal and also fails to disclose any phenotype of the claimed transgenic animal. Applicants respectfully disagree.

Written description can be satisfied through disclosure of relevant identifying characteristics, i.e., structure, or other physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics. What is well known in the art need not be disclosed. If a

skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, (even if it were asserted that every nuance of the claim is not explicitly described in the specification), then the adequate description requirement is met. Chisum on Patents §7.04[1][c].

As noted in the MPEP at § 2163, "To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention."

Notably, the sequence of the FTL variant gene is provided in the specification along with the phenotype associated with hereditary ferritinopathy. The declaration by Dr. Vidal describing the generation of FTL-variant transgenic mice also indicates that the transgenic mice claimed were fully described in the application as filed. In view of the successful generation of FTL-variant transgenic animals with the desired phenotype, it cannot be reasonably maintained that Applicants were not in possession of the invention.

Based on the foregoing, Applicant submits that the specification and claims as amended provide sufficient identifying characteristics of the methods of the invention to meet the written description requirement under 35 U.S.C. §112, first paragraph.

In light of the foregoing amendments, remarks, declaration, and evidence submitted by Dr. Vidal, Applicants submit that the present claims satisfy all of the requirements of U.S.C. § 112, first paragraph and, therefore, request that the rejection of the claims on this ground be withdrawn.

As a final matter, Applicants request that the Examiner consider rejoining withdrawn claim 22 with the product claims currently being examined. Claim 22 is drawn to a method using the FTL-variant transgenic mice for identifying agents which may be useful for modulating the formation of intranuclear and intracytoplasmic ferritin bodies. Support for this amendment to claim 22 can be found at page 79, lines 4-11. Pursuant to MPEP §821.04, "if applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims which depend from or otherwise include all the limitations of the allowable product claim will be rejoined." Applicants submit that this is exactly the case for product claim 17 and withdrawn process claim 22.

CONCLUSION

In view of the amendments presented herewith and the foregoing remarks, it is respectfully urged that the objections and rejections set forth in the August 14, 2006 Official Action be withdrawn and that this application be passed to issue.

In the event the Examiner is not persuaded as to the allowability of any claim, and it appears that any outstanding issues may be resolved through a telephone interview, the Examiner is requested to call the undersigned agent at the phone number given below.

Respectfully submitted,
DANN, DORFMAN, HERRELL AND SKILLMAN
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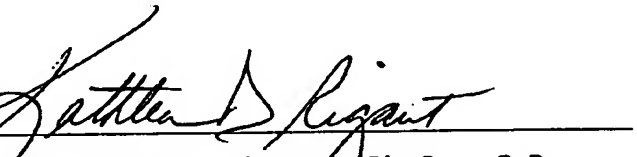
By 

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